AF/2121
IFW

Docket No.: 37005-171895
(PATENT)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of:
Bella et al.

Application No.: 09/881,746 Confirmation No.: 8757

Filed: June 18, 2001 Art Unit: 2121

For: SCALEABLE OBJECT RECOGNITION WITH A BELIEF MODEL Examiner: M. Bell

APPELLANT'S BRIEF

MS Appeal Brief - Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

This brief is in furtherance of the Notice of Appeal, filed in this case on July 13, 2004.

The fees required under § 1.17(f) and any required petition for extension of time for filing this brief and fees therefor, are dealt with in the accompanying TRANSMITTAL OF APPEAL BRIEF.

This brief is transmitted in triplicate.

This brief contains items under the following headings as required by 37 C.F.R. § 1.192 and M.P.E.P. § 1206:

I. Real Party In Interest
II Related Appeals and Interferences
III. Status of Claims
IV. Status of Amendments
V. Summary of Invention
VI. Issues
VII. Grouping of Claims
VIII. Arguments

IX. Claims Involved in the Appeal
Appendix A Claims

I. REAL PARTY IN INTEREST

The real party in interest for this appeal is:

Lockheed Martin Mission Systems, assignee of Appellants Ivan Bella and Chris Hood.

II. RELATED APPEALS AND INTERFERENCES

To the best of the undersigned's belief, there are no other appeals or interferences which will directly affect or be directly affected by or have a bearing on the Board's decision in this appeal.

III. STATUS OF CLAIMS

A. Total Number of Claims in Application

There are 20 claims pending in application, which were all finally rejected in the Final Office Action ("Action") mailed February 20, 2004.

B. Current Status of Claims

1. Claims canceled: 6, 15, and 16.

2. Claims pending: 1-5, 7-14, and 17-23.

3. Claims rejected: 1-5, 7-14, and 17-23.

C. Claims On Appeal

The claims on appeal are claims 1-5, 7-14, and 17-23.

IV. STATUS OF AMENDMENTS

No amendments were filed subsequent to the final rejection. The claims in Appendix A do incorporate the amendments indicated in the paper filed by Applicant on February 6, 2004 and accepted by the Action of February 20, 2004.

V. SUMMARY OF INVENTION

The present invention provides a system and method of object recognition. The system, as illustrated, for example, in Fig. 1A, comprises a ***blackboard*** (e.g. 101), a belief model (e.g. 104), a belief network (e.g. 114), and a relations subsystem (e.g. 110). The blackboard is made up of a plurality of ***experts*** (e.g. 126, 130), data, and a controller (e.g. 118) to control the experts.

The belief model includes a set of beliefs, and a ***set of rules deduced from a learning system***, where the learning system includes truth data files for deducing the beliefs. Additionally, the truth data files can deduce ***shadow objects***. Shadow objects are objects for which no expert exists, i.e. unknown objects. The system can learn to recognize shadow objects by adding experts to the blackboard system.

VI. ISSUES

Issues on appeal are as follows:

(1) whether claims 1-5, 7-14 and 17-23 are anticipated by Lin et al "Dempster-Shafer Reasoning for Medical Image Recognition" (November 1991) ("Lin") under 35 U.S.C. §102(b); and

(2) whether claims 1-5, 7-14 and 17-23 are unpatentable under 35 U.S.C. §103(a) over Lin in view of U.S. Patent No. 6,058,206 to Kortge ("Kortge") and U.S. Patent No. 5,418,888 to Alden ("Alden").

VII. GROUPING OF CLAIMS

For purposes of this appeal brief only, and without conceding the teachings of any prior applied reference, the claims have been grouped as indicated below:

Group	Claim(s)
I.	1-5, 7-14 and 17-21
II.	22
III.	23

In Section VIII below, Applicants have included arguments supporting the separate patentability of each claim group as required by M.P.E.P. § 1206.

VIII. ARGUMENTS

Each group of claims is patentable for at least the reasons set forth below.

Issue 1: whether claims 1-5, 7-14 and 17-23 are anticipated by Lin under 35 U.S.C. §102(b)

(A) Group I (claims 1-5, 7-14 and 17-21)

The Action generally alleges anticipation on pages 2-4, but fails to set forth particularly how each element of claim 1, as amended on February 6, 2004, is anticipated by Lin. Nevertheless, Applicants respectfully note that Lin fails to teach or suggest at least three elements of claim 1.

First, Lin does not disclose or teach a blackboard comprising a ***plurality of experts***. Lin does state that a "blackboard model is composed of three major components: knowledge sources, blackboard data sources, and control." Lin, p. 482, section 4, last sentence. The Action of November 6, 2003 appears to align the "knowledge sources" of Lin with the plurality of experts of claim 1. In particular, the Action relies on Lin's statement, in the Abstract, that Dempster-Shafer theory is being used in an expert system modeled on a blackboard system. This alignment is not correct.

Lin describes the knowledge sources as including knowledge of: 1) sensor characteristics, (2) anatomical structures, and (3) procedures of image processing and analysis. Lin, p. 482, sect. 4.1. The knowledge of (1) sensor characteristics of Lin includes assignments of belief intervals to fuzzy variables that represent the visibility of five types of structures to be recognized from a medical image. Lin, p. 482, sect. 4.1.2. The knowledge of (2) anatomical structures of Lin includes construction of a knowledge base of high level abstractions (e.g. bone, white matter, ventricle) and

"techniques to correlate" primitive features, e.g. curves, to the knowledge base. Lin, p. 483, sect. 4.1.3. The techniques to correlate include the construction of analyzers that provide beliefs about the primitive features. The knowledge of (3) image processing and analysis refers to a segmentation algorithm that partitions an input image into regions and computes features of each region. Lin, p. 482, sect. 4.1.1. None of these "knowledge sources" are the plurality of experts as claimed in claim 1.

In contrast, the plurality of experts of claim 1 may be a group of specialized functions or programs that perform operations on the image data. These experts can be any kind of processing. The principles the different experts operate on can be similar or they can be completely different. Even the languages used to implement the experts can vary. In other words, the experts can be completely heterogeneous, which is one of the main strengths of the Blackboard architecture, its ability to bring together disparate types of processing in order to solve a common problem. See p. 13 line 20 – p. 14, line 8. Therefore, Lin does not disclose or teach a blackboard comprising a plurality of experts.

Second, Lin fails to teach a belief model, comprising a set of beliefs and probabilities associated with each belief of said set of beliefs, wherein said belief model comprises a set of ***rules deduced from a learning system***. The Action asserts that Lin teaches this limitation on page 481, sect. 3, sentence 2. In fact, this statement merely states that rules in the proposed medical imaging recognition system are represented in the form of a multivariate belief function. Lin states further that the rules for characterizing spatial relationships among anatomical structures are **predefined**. See Lin page 483, section 4.1.3, "Spatial Relationship." These pre-defined rules are therefore not **deduced** from a learning system. Lin does not discuss how any other rules that may be used by its system are obtained. In contrast, the belief model of Applicants' invention includes a set of rules deduced by the learning system, which describes how the different object classes that the recognition system can recognize are related to each other both spatially and statistically. All of the rules are **deduced** from a body of truthed training data provided to the learning system. See page 19, lines 7-10. Therefore, Lin fails to teach a belief model, comprising a set of beliefs and probabilities associated with each belief of said set of beliefs, wherein said belief model comprises a set of rules deduced from a learning system.

Third, Lin fails to teach a learning system comprising ***truth data files for deducing*** said set of beliefs, probabilities and ***shadow objects***. Shadow objects provide a method of identifying objects that do not have specific recognition experts. See, e.g., page 11, lines 10-13. Instead, Lin teaches a system that can recognize only a **finite** number of **known** element types, i.e. body parts, such as, e.g. a liver or a lung. See Lin p. 482, section 4, 1st paragraph. There is no discussion in Lin of how its system may deal with an unknown object. In contrast, the truth data files of Applicants' invention can allow the system to learn to recognize new, unknown objects by deducing a set of beliefs, probabilities and shadow objects. A truth data file can contain, for example, for each object identified in the image: the object's class id, its bounding box's position and size, and a flag to indicate whether or not the object is a shadow object. See, e.g., page 27, lines 19-21. Therefore, Lin fails to teach a learning system comprising truth data files for deducing the set of beliefs, probabilities and shadow objects.

Consequently, because Lin fails to teach at least these three elements of claim 1, claim 1 is allowable.

Claims 2-5, 7-14, and 17-21 depend from claim 1 and are allowable as being dependent from an allowable claim.

Group II (Claim 22):

The Action generally alleges anticipation, but fails to set forth how each element of claim 22, as amended on February 6, 2004, is allegedly anticipated by Lin. Nevertheless, Applicants respectfully submit that Lin fails to teach or suggest at least three elements of claim 22.

Claim 22 recites elements similar to those recited in claim 1. As discussed above regarding claim 1, Lin fails to teach (1) developing a belief model by ***deducing a set of rules from a learning system***; and (2) a learning system comprising ***truth data files for deducing*** beliefs, probabilities and ***shadow objects***.

Third, Lin fails to teach ***deducing said shadow objects from said belief model***. Instead, there is **no** discussion in Lin of whether, or how, objects of a previously unknown type are handled in the Lin system. The Lin system is limited to identifying structure that fall within a finite set of anatomical structures. In contrast, Applicants' invention deduces shadow objects from the belief

model. Prediction of a shadow object is accomplished by searching the belief model rules whenever a new object is instantiated on one of the object class blackboards. If a rule is found which contains the new object's object class, and the object class is that of a shadow object, then a shadow object of the object class is created in the shadow object blackboard. See p. 15, lines 25-30. Therefore, Lin fails to teach deducing said shadow objects from said belief model.

Consequently, because Lin fails to teach at least these three elements of claim 22, claim 22 is allowable.

Group III (Claim 23):

The Action generally alleges anticipation, but fails to set forth how each element of claim 23, as amended on February 6, 2004, is anticipated by Lin. Nevertheless, Applicants' respectfully submit that Lin fails to teach or suggest at least five elements of claim 23.

Claim 23 recites some elements similar to those recited in claims 1 and 22. As discussed above regarding claims 1 and 22, Lin fails to teach (1) an ***expert***; (2) a learning system comprising ***truth data files for deducing*** beliefs, probabilities and ***shadow objects***; and (3) ***deducing*** a set of rules from said learning system.

In particular, Lin fails to teach any of ***creating***, ***encapsulating*** and ***compiling*** an expert. Lin does not teach experts as recited in claim 23. Instead, Lin teaches a set of **analyzers** that each evaluate one feature of a region, e.g. intensity, location, orientation. Lin, p. 483, sect. 4.1.3. These analyzers are constructed. There is no further discussion of how the analyzers are constructed. Therefore, Lin does not teach any of creating, encapsulating and compiling an expert.

Fourth, Lin fails to teach ***determining if the output*** of [a new] expert ***is new***. Instead, the analyzers, which are not experts, generate a conditional probability of whether a feature is support[ed], objection[able], or "ignorance" [state unknown]. Lin p. 483, sect. 4.1.3. In contrast, in the method of claim 23, if the new expert's output is new, the output's object class must be added to the blackboard and the belief model can be updated. See p. 12, lines 6-8. Therefore, Lin fails to teach determining if the output of [a new] expert is new.

Fifth, Lin fails to teach ***adding the new output's class to said blackboard***. Lin, in fact, does **not** discuss adding **any** output to a blackboard, let alone a new output class. Therefore, Lin fails to teach adding the new output's class to said blackboard.

Consequently, because Lin fails to teach at least these five elements of claim 23, claim 23 is allowable.

Issue 2: whether claims 1-5, 7-14 and 17-23 are unpatentable under 35 U.S.C. §103(a) over Lin in view of Kortge and Alden.

(A) Group I (claims 1-5, 7-14 and 17-21)

Lin, Kortge, and Alden, alone or in combination fail to teach or suggest at least two elements of claim 1.

The Action asserts that Lin teaches all of the elements of claim 1 except for a learning system, which the Action asserts is taught by Kortge; and a truth data file, which the Action asserts is taught by Alden. In addition to not teaching these elements of claim 1, as discussed above in reference to Issue 1 and Group 1, Lin does not teach at least three other elements of claim 1: (1) a blackboard system comprising a plurality of experts; (2) a set of rules deduced from a learning system; and (3) a learning system comprising truth data files for deducing said set of beliefs, probabilities and shadow objects.

Kortge does not overcome the deficiencies of Lin.

First, Kortge fails to teach a ***blackboard*** system comprising a plurality of ***experts***. Instead, Kortge teaches an adaptive pattern recognizer that can be trained from examples. Kortge, col. 1, lines 5-7. However, Kortge does **not** teach or suggest, or even mention, a blackboard system comprising a plurality of experts.

Second, Kortge fails to teach ***a belief model***, comprising a set of beliefs and probabilities associated with each belief of said set of beliefs, wherein said belief model comprises a set of ***rules deduced from a learning system***. Instead, Kortge fails to teach or mention a belief model at all.

Alden does not overcome the deficiencies of either Lin or Kortge, alone or in combination.

First, Alden also fails to teach a ***blackboard*** system comprising ***a plurality of experts***. Instead, Alden teaches an expert system that allows a **human expert** to model his expertise directly

in computer software, without requiring programming knowledge. The human expert creates a **knowledge base** by creating objects, e.g. a necessary fact, calculated result, conclusion, and specifies a relationship among the objects to perform an analysis. Alden, col. 2, lines 4, 42-49. The knowledge base system of Alden is **not** a blackboard system.

Second, Alden fails to teach ***a belief model***, comprising a set of beliefs and probabilities associated with each belief of said set of beliefs, wherein said belief model comprises a set of ***rules deduced from a learning system***. Instead, Alden teaches a knowledge base that is searched and analyzed. The relationships among the objects in the knowledge base are established externally by the human expert, and are not deduced from a learning system.

Therefore, Lin, Kortge, and Alden, alone or in combination, fail to teach the elements of claim 1. Applicants respectfully request that the rejection be withdrawn.

Claims 2-5, 7-14, and 17-21 depend from claim 1 and are allowable as being dependent from an allowable claim.

Group II (Claim 22):

Lin, Kortge, and Alden, alone or in combination, fail to teach or suggest at least one element of claim 22.

Claim 22 recites elements similar to those recited in claim 1. As discussed above regarding claim 1 and Issue 1, Lin fails to teach (1) identifying classes of objects specified by a user ***using a plurality*** of cooperative object recognition ***experts***; (2) developing a belief model by ***deducing a set of rules from a learning system***; (3) a learning system comprising ***truth data files for deducing*** beliefs, probabilities and ***shadow objects***; and (4) ***deducing said shadow objects from said belief model***.

Kortge fails to overcome the deficiencies of Lin. In particular, Kortge fails to teach ***deducing said shadow objects from said belief model***. Instead, the feature detectors are trained on known objects, e.g. the letters of the alphabet. The classifier takes the combined output of the feature detectors and outputs a probable object, based on the features detected and the rules learned, e.g. a top horizontal line and a middle vertical line probably mean a "T". Once trained, however, Kortge cannot recognize unknown objects, or learn to recognize unknown objects. For example, if

a character from a different alphabet, such as Arabic, were presented, the Kortge system would only be able to present its best guess as to which known character matched the most features of the new character. Therefore, Kortge fails to teach deducing said shadow objects from said belief model.

Alden fails to overcome the deficiencies of Lin and Kortge.

First, Alden fails teach developing a belief model by ***deducing a set of rules from a learning system***. Instead, as discussed above, Alden teaches a knowledge base that is searched and analyzed. The relationships among the objects in the knowledge base are established **externally** by the human expert, and are not deduced from a learning system. Therefore, Alden fails teach developing a belief model by deducing a set of rules from a learning system.

Second, Alden fails to teach ***deducing said shadow objects from said belief model***. The Action asserts that Alden teaches predicting unrecognized objects, for example at col. 46, lines 6-16 and col. 47, lines 61-63. In fact, in these passages, Alden discusses the uncertainty or degree of confidence that a given condition is true, and various alternatives for representing certainty. There is no teaching or suggestion that shadow objects are deduced from a belief model.

Group III (Claim 23):

Lin, Kortge, and Alden, alone or in combination fail to teach or suggest at least two elements of claim 23.

Claim 23 recites some elements similar to those recited in claims 1 and 22. As discussed above regarding claims 1 and 22 and Issue 1, Lin fails to teach (1) an ***expert***; (2) a learning system comprising ***truth data files for deducing*** beliefs, probabilities and ***shadow objects***; (3) ***deducing*** a set of rules from said learning system; (4) ***determining if the output*** of [a new] expert ***is new***; and (5) ***adding the new output's class to said blackboard***.

Kortge fails to overcome the deficiencies of Lin. As discussed above with respect to claim 22, Kortge does not handle new output once the system is trained to recognize a set of object, such as an alphabet. Therefore, Kortge does not determine if the combination of features detected is new. Kortge only provides the most probable result from its collection of learned patterns.

Second, Kortge fails to teach adding the new output's class to said blackboard. Although Fig. 2 of Kortge suggests that training may take place after recognition, there is no discussion in Kortge of the results of recognition being used in training, or of new detectors being added. Instead, at best, a feature detector may be modified. Therefore, Kortge fails to teach adding the new output's class to said blackboard

Alden fails to overcome the deficiencies of Lin and Kortge. As discussed above regarding claim 22, Alden does not teach either a learning system comprising ***truth data files for deducing*** beliefs, probabilities and ***shadow objects***; or ***deducing*** a set of rules from said learning system.

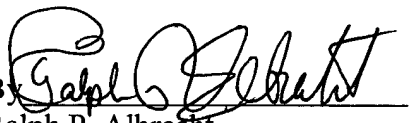
Therefore, Lin, Alden and Kortge, alone or in combination, fail to teach or suggest the elements of claim 23. Claim 23 is therefore allowable, and Applicants respectfully request that the rejection be withdrawn.

IX. CLAIMS INVOLVED IN THE APPEAL

A copy of the claims involved in the present appeal is attached hereto as Appendix A. As indicated above, the claims in Appendix A do include the amendments filed by Applicants on February 6, 2004.

Dated: September 13, 2004

Respectfully submitted,

By 

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APPENDIX A

Claims Involved in the Appeal of Application Serial No. 09/881,746

1. A system operative to recognize objects in content comprising:

a blackboard comprising

a plurality of experts, and

data comprising original input data and data created by processing of any of said plurality of experts, and

a controller operative to control said experts;

a belief model, coupled to said controller, comprising a set of beliefs and probabilities associated with each belief of said set of beliefs, wherein said belief model comprises a set of rules deduced from a learning system, said learning system comprising truth data files for deducing said set of beliefs, probabilities and shadow objects, a learning system controller and a statistics space controlled by said learning system controller, wherein said set of rules describes how different classes recognized by said learning system are related to each other spatially and physically;

a belief network, coupled to said controller; and

a relations subsystem, coupled to said controller.

2. The system according to claim 1, wherein said experts comprise expert object recognizers comprising at least one of:

region identification experts;

color region experts;

a corner recognizer;

a closed curve recognizer;

a roof recognizer;

a text recognizer;

simulated experts;

microphone recognizer;
space suit recognizer;
satellite recognizer;
a geometric shape recognizer;
a building recognizer;
an egg recognizer;
a dice recognizer;
a person recognizer;
a face recognizer; and
a product recognizer.

3. The system according to claim 1, wherein said data comprises at least one of:
relations data;
expert status data;
image subsection data; and
said belief model.

4. The system according to claim 1, wherein said controller is at least one of:
operative to choose chosen experts from said plurality of experts which are to be executed;
operative to schedule execution of said chosen experts; and
operative to execute said chosen experts.

5. The system according to claim 1, wherein said blackboard further comprises at least one of:
storage for receiving an input image; and
a reporter operative to output results of processing.

7. The system according to claim 1, wherein said belief model is operative to predict existence of a shadow object in an image even if there are no specific experts capable of recognizing said shadow object.

8. The system according to claim 1, wherein said belief network is operative to combine beliefs in output data output by said experts and probabilities drawn from said belief model into a single belief for a given object.

9. The system according to claim 1, wherein said relations subsystem is operative to determine how returned objects returned by said experts are related to each other.

10. The system according to claim 1, wherein said relations subsystem is operative to determine spatial relations.

11. The system according to claim 10, wherein said spatial relations include types comprising at least one of:

a north type,
a south type,
an east type,
a west type,
a contains type,
a contained by type, and
an adjacent to type.

12. The system according to claim 1, wherein said relations subsystem is operative to determine temporal relations.

13. The system according to claim 12, wherein said temporal relations include types comprising at least one of:

a before type,
an after type, and
an exists with type.

14. The system according to claim 1, wherein the content comprises at least one of:
video;
an image;
digitized content; and
a frame.

17. (currently amended). The system according to claim 1, wherein said learning system is operative to assist in integrating a new expert, said new expert being adapted to create, encapsulate and compile said new expert; to add a stub function to said blackboard; if output of said new expert is new, to add the output to said belief model; and to add a blackboard rule to control when said new expert is to be executed.

18. The system of claim 1, wherein said belief network is at least one of:
a Bayesian Network;
a mean probability; and
a Dempster-Shafer Network.

19. The system according to claim 1, wherein said belief model comprises:
rules operative to be used to make a determination whether or not one of said experts should be executed by search of said belief model to determine whether an adaptable threshold of supporting evidence has been exceeded for an execution supportability rule that evaluates outputs of currently executing experts.

20. The system according to claim 1, wherein said belief model is operative to model expected object associations, to weigh relative object positions, and to tie a probability or belief value to those associations.

21. The system according to claim 1, wherein said belief network is operative to combine the belief model with hypotheses generated by said experts to form belief values for hypothesized objects.

22. A method of recognizing objects comprising:

identifying classes of objects specified by a user using a plurality of cooperative object recognition experts;

achieving higher accuracy from using in parallel said plurality of cooperative object recognition experts than is achievable using in serial said plurality of cooperative object recognition experts;

supporting scaleability of performance including supporting multiple processors;

developing a belief model by deducing a set of rules from a learning system, said learning system comprising truth data files for deducing beliefs, probabilities and shadow objects, a learning system controller and a statistics space controlled by said learning system controller, said set of rules describing how different classes recognized by said learning system are related to each other spatially and physically, the developing of said belief model including

specifying specified associations among said objects,

learning learned associations among said objects,

representing said specified and learned associations, and

forming a belief network

wherein said belief network is at least one of a Bayesian Network and a Dempster Shafer Network; and

deducing said shadow objects from said belief model.

23. A method for adding a new expert to a blackboard comprising:

creating an expert;

encapsulating said expert;

compiling said expert;

adding a stub function to a blackboard;

determining if output of said expert is new and if new, then

adding the output's class to said blackboard, and

updating a belief model by providing truth data file data to a learning system, said learning system comprising truth data files for deducing beliefs, probabilities and shadow objects, a learning system controller and a statistics space controlled by said learning system controller;

creating a rule to control when said new expert is to be executed when supporting evidence is found to exceed an adaptable threshold; and

deducing a set of rules from said learning system, said set of rules describing how different classes recognized by said learning system are related to each other spatially and physically.

PTO/SB/17 (10-03)
Approved for use through 7/31/2006. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

FEE TRANSMITTAL for FY 2004

Effective 10/01/2003. Patent fees are subject to annual revision.

☐ Applicant claims small entity status. See 37 CFR 1.27

TOTAL AMOUNT OF PAYMENT ($) 330.00

Complete if Known	
Application Number	09/881,746-Conf. #8757
Filing Date	June 18, 2001
First Named Inventor	Ivan Bella
Examiner Name	M. Bell
Art Unit	2121
Attorney Docket No.	37005-171895

METHOD OF PAYMENT *(check all that apply)*

☒ Check ☐ Credit Card ☐ Money Order ☐ Other ☐ None

☐ Deposit Account:

Deposit Account Number: 22-0261

Deposit Account Name: Venable LLP

The Director is authorized to: *(check all that apply)*

☐ Charge fee(s) indicated below ☒ Credit any overpayments

☒ Charge any additional fee(s) or any underpayment of fee(s)

☐ Charge fee(s) indicated below, **except for the filing fee** to the above-identified deposit account.

FEE CALCULATION

1. BASIC FILING FEE

Large Entity Fee Code	Large Entity Fee ($)	Small Entity Fee Code	Small Entity Fee ($)	Fee Description	Fee Paid
1001	770	2001	385	Utility filing fee	
1002	340	2002	170	Design filing fee	
1003	530	2003	265	Plant filing fee	
1004	770	2004	385	Reissue filing fee	
1005	160	2005	80	Provisional filing fee	

SUBTOTAL (1) ($) 0.00

2. EXTRA CLAIM FEES FOR UTILITY AND REISSUE

			Extra Claims		Fee from below		Fee Paid
Total Claims		-** =		x		=	
Independent Claims		-** =		x		=	
Multiple Dependent						=	

Large Entity Fee Code	Large Entity Fee ($)	Small Entity Fee Code	Small Entity Fee ($)	Fee Description
1202	18	2202	9	Claims in excess of 20
1201	86	2201	43	Independent claims in excess of 3
1203	290	2203	145	Multiple dependent claim, if not paid
1204	86	2204	43	** Reissue independent claims over original patent
1205	18	2205	9	** Reissue claims in excess of 20 and over original patent

SUBTOTAL (2) ($) 0.00

***or number previously paid, if greater; For Reissues, see above*

FEE CALCULATION (continued)

3. ADDITIONAL FEES

Large Entity Fee Code	Large Entity Fee ($)	Small Entity Fee Code	Small Entity Fee ($)	Fee Description	Fee Paid
1051	130	2051	65	Surcharge – late filing fee or oath	
1052	50	2052	25	Surcharge – late provisional filing fee or cover sheet.	
1053	130	1053	130	Non-English specification	
1812	2,520	1812	2,520	For filing a request for *ex parte* reexamination	
1804	920*	1804	920*	Requesting publication of SIR prior to Examiner action	
1805	1,840*	1805	1,840*	Requesting publication of SIR after Examiner action	
1251	110	2251	55	Extension for reply within first month	
1252	420	2252	210	Extension for reply within second month	
1253	950	2253	475	Extension for reply within third month	
1254	1,480	2254	740	Extension for reply within fourth month	
1255	2,010	2255	1,005	Extension for reply within fifth month	
1401	330	2401	165	Notice of Appeal	
1402	330	2402	165	Filing a brief in support of an appeal	330.00
1403	290	2403	145	Request for oral hearing	
1451	1,510	1451	1,510	Petition to institute a public use proceeding	
1452	110	2452	55	Petition to revive – unavoidable	
1453	1,330	2453	665	Petition to revive - unintentional	
1501	1,330	2501	665	Utility issue fee (or reissue)	
1502	480	2502	240	Design issue fee	
1503	640	2503	320	Plant issue fee	
1460	130	1460	130	Petitions to the Commissioner	
1807	50	1807	50	Processing fee under 37 CFR 1.17(q)	
1806	180	1806	180	Submission of Information Disclosure Stmt	
8021	40	8021	40	Recording each patent assignment per property (times number of properties)	
1809	770	2809	385	Filing a submission after final rejection (37 CFR 1.129(a))	
1810	770	2810	385	For each additional invention to be examined (37CFR 1.129(b))	
1801	770	2801	385	Request for Continued Examination (RCE)	
1802	900	1802	900	Request for expedited examination of a design application	
Other fee (specify)					

*Reduced by Basic Filing Fee Paid

SUBTOTAL (3) ($) 330.00

SUBMITTED BY				(Complete *(if applicable)*)	
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Signature				*Date*	September 13, 2004

DC2-579753

TRANSMITTAL OF APPEAL BRIEF	Docket No. 37005-171895

In re Application of: Bella et al.

Application No.	Filing Date	Examiner	Group Art Unit
09/881,746-Conf. #8757	June 18, 2001	M. Bell	2121

Invention: SCALEABLE OBJECT RECOGNITION WITH A BELIEF MODEL

TO THE COMMISSIONER OF PATENTS:

Transmitted herewith in triplicate is the Appeal Brief in this application, with respect to the Notice of Appeal filed: July 13, 2004 .

The fee for filing this Appeal Brief is 330.00 .

[X] Large Entity [ ] Small Entity

[X] A check in the amount of 330.00 is enclosed.

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Dated: September 13, 2004

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